Research Paper | Education | E-ISSN No : 2454-9916 | Volume : 2 | Issue : 8 | August 2016

APPLICATION AND RESEARCH ON "CULTURAL AND CREATIVE PLATFORM OF IMAGE AND MULTI-MEDIA DISPLAY WITH CLOUD TECHNOLOGY

* Chien-Sheng Chen [1] | Yuan-Min Liao [2] | Lan-Hsun Wang [3] | Kai-Sheng Chen [4]

[1] Associate Professor, Department of Information Management, Tainan University of Technology, Tainan, Taiwan - 71002. (*Corresponding Author)

[2] Assistant Professor, Department of Fashion Design and Management, Tainan University of Technology, Tainan, Taiwan - 71002.

[3] Instructor, Department of Hotel Management, Tainan University of Technology, Tainan, Taiwan - 71002.

[4] Technician, Network and Information Center, Tainan University of Technology, Tainan, Taiwan - 71002.

ABSTRACT

Cultural and creative industry is originated from human's creativity and cultural accumulation and has the potential to increase a nation's productivity and employment opportunity. These developing processes are worthy of being recorded and reused. However, there is lack of a platform of collecting different creations. As for users, it was difficult to overview a series of pieces simultaneously. Even if they find the desired one, it cannot be for further use due to authorization reasons. Hence, this study aims to build a digital platform with cloud technology to enable authors to upload their creations and shared them with other people. Under conditional authorization, users can save or acquire files on the platform with ease. Also, management interfaces of collection, authorization text and keyword search are included to support the upload of 2D and 3D items. This platform can be a significant promotion to the development of cultural and creative industry.

KEYWORDS: Cloud computing, cloud storage, digital archive, cultural and creative industry.

Introduction

Cultural and creative industry, proposed by British in 1997, has become one of the key industries for most countries around the world. Taiwan also established cultural industry as a main target of development after executing "Challenge 2008: National Development Plan" in 2002. Because of its additional high value, this industry pours Taiwan's manufacture-based industry new energy. By 2011, along with the efforts of government sectors and entrepreneurs, the output value was 600 billion NT dollars, about 4.9 percent of the gross national income. From the above data, the cultural industry has been significantly helpful in cultivating a favorable environment for employment and promoting the development of the national economy. Meanwhile, various artistic works are created by members of the government, company and other civil organizations. Different types of exhibitions and performances always attract many audiences to experience the abundant energy of culture and creation in Taiwan.

However, after exhibitions, works and those not shown in the display were always put in a storage room or were collected by authors. Thus, the audiences cannot view different types of artifacts efficiently, and the opportunities for authors interacting with others are reduced. Furthermore, as the growth of information technology, techniques of digitalizing cultural works become more mature. Works on paper, such of paintings and modern poster designs, can be preserved digitally by scanning or snapping. Performances of music, drama and dance can also be transformed to multi-media files through recording. These digital files are not sensitive to environmental variation. Users interested in cultural fields can easily view different types of pieces on the Internet without the limitation of space and time after the artworks are uploaded to an electronic platform. Many institutions such as museums and libraries have used "digital archive" technique to digitalize information to achieve a goal of knowledge conservation and inheritance. Based on above reasons, this research adopts the concept of "digital archive" to build an electronic platform that collects cultural creations in digital form. These archives can be effectively managed and are suitable for teachers designing related classes.

Furthermore, a significant number of high-quality videos and high-pixel images are required to store to preserve cultural works adequately and correctly. As semesters pass, the collected contents increase, resulting issues of the storage space or the update of hardware and software. Another bottleneck arises from the file exchange between different institutions, due to the inconsistency of data format. Cloud computing solves the problems mentioned above. Users down/upload file freely without the consideration of hard disk capacity and resource allocation, once they connect to The Internet. As the infrastructures of cloud computing become common, cloud storage has been thought as an appropriate solution.

Hence, this research took the advantages of cloud computing to build the "Cultural and Creative Platform of Image and Multi-Media Display" to help collect divergent artworks. Note that the traditional storage service is mostly provided by internet service provider (ISP), which is costly in device maintenance. Network and Information Center in Tainan University of Technology (TUT) was commissioned to build the platform so that it only takes a small amount of fee to manage effectively numerous cultural works. Also, a high-visibility platform for creations is offered to authors around the country.

Literature Review

1. Digital Archive

Recently, a wide-spread trend of digitalizing culture creations accelerates the development of digital archive. People can access these works by communication techniques to learn and realized different aspects of culture. Methods of digital archive transform specific and intangible information into files in digital format, to help reach the purpose of data preservation and additional value application (Tsai, S. T., Su, W. C., & Chiu, C. Y., 2012). Moreover, as long as the items relate to human civilization and have cultural meanings, they belong to the field of the digital archive. Since the digitalized contents are not limited to art works, animal, plant even mineral specimens could be the targets of preserving. The data format includes 2D/3D images, and multimedia files of voice, music and videos. Constructing electronic art pieces not only includes manually scanning, photographing, printing and recording, but requires functions of various technical instruments, such as color fixing and image processing. Unlike conventional electronic files, archive data has a high requirement for integrity and correctness, for example, pixel standard of pictures, partial close-ups, and filming from multiple angles (Cheng, P. Y., & Yang, M. L., 2004).

Also, since the categories of digital archive are manifold, many researchers have proposed processes of artwork digitalization mainly based on four periods of digital information: generation, archiving, broadcast and usage extension. Compared to the conventional transform of data format, according to the characteristics of digital archive, it can be divided into six steps: collection, post-process, archiving, additional application, broadcast and using, and display (Tsai, Y. C., Huang, G. L., & Qiu, Z. Y., 2007). Based on the digital environment, the life cycle of archiving contains data support, message, and knowledge production, broadcast and using, and archiving (Ho, J. M., Huang, S. K., Chuang, T. R., & Lee, D. T., 2000). The concept of standard operation process (SOP) is also adopted in the plan of digital archive to ensure the consistency of data format and cope with the requirement for inter-field applications in the future (Cheng, P. Y., & Yang, M. L., 2004). Furthermore, integrated management is used to build the digital contents in the archive in a universal information operation platform (Rockley, A., Kostur, P., & Manning, S., 2003).

2. Cloud Storage

Cloud computing is a computational algorithm based on Internet work. Its main specialties are resource sharing and dynamical allocation, that is, computation, storage and hard/software resources are optimally arranged in the Internet. "Cloud" indicates the virtual internet architecture and users can access the resources in the "cloud" via network broadcast anytime without knowing the operating techniques and functions. Moreover, the development of cloud computing also promotes the emergence of "information utility". Computer

resources are as available as public utility services, greatly increasing the convenience of human life. Business clients do not have to spend considerable manpower and management costs in equipment replacement, renewal and expansion. The providers of cloud computing offer scalable service to users based on their demands, as they only pay the fee based on the using amount or capacity. Characteristics of cloud computing are similar to common public utilities such as electricity and running water, so it is also known as "utility computing".

Cloud storage, belonging to the field of cloud computing, is a way of storage in the network. Data is stored at the remote host (Wikipedia, 2015). Suppliers set up virtualized resources at the back-end while users get data storage space by purchasing or renting. Also, cloud storage uses web-based interface, allowing users to download files by Internet connection. Due to the support for update, the information is maintained in the latest version. Thus, the "local storage" mode saving the files on the hard drive of PC or flash drive has gradually shifted to cloud storage. Also, because of the increasing number of mobile phone users, the development of cloud storage moves toward to support "multi-device" access, providing cross-platform data storage, backup, and synchronization in computers, mobile phones, and tablets. By far, there are a variety of cloud storage methods for users. In addition to Google Drive supporting file browsing and editing, there are Dropbox with instant upload of pictures and sound files, and ASUS Webstorage compatible to "cloud printing". Storage spaces from 2 to 5GB are provided by the above applications. Zumo Drive aims the users of iOS and introduces a program based on music storage, along with the capability of music streaming.

In conclusion, cloud storage does not restrict by hard/software implementation so that files can be put in long-term preservation, and therefore it implies a viable approach for digital collection. There are lots of works of literature on using cloud storage as for digital archives. For example, researchers explored the international open archival information system (OAIS) and its relevance to cloud storage, providing the guidelines for long-term preservation of digital file system. The following advantages are made as arguments: 1) enhancing the efficiency of conservation and the quality of digital archiving, as well as reducing the time and risk when building the system, 2) supporting a large-capacity storage space and saving the hardware cost, 3) developing a standard format for archiving and offering customized service, 4) increasing users' convenience while minimizing the operational differences from several vendors of cloud storage, 5) spreading the risk of data loss by off-site backup with a group of suppliers (Ci, 2012). The items for collections extend from the art heritage to local environmental objects. Hakka Cultural Institute, National Chiao Tung University, Hsinchu, Taiwan, archived objects with Hakka cultural characteristics and recorded images of Hakka environment. Visitors could view all of the cloud-stored contents selected from Hengshan Hakka Township on a touchable screen (Lin, 2013).

Research Method

Since the mainstream of the future education is innovative, real-time and interactive teaching, as well as self-learning, space and the environment is no longer a barrier to education. Therefore, this study uses cloud virtualization and dynamic resource allocation for the development of "Cultural and Creative Platform of Image and Multi-Media Display". The cloud-based platform combines education, network, and cloud system to achieve pluralistic education and deal with the challenges arising from the changes in the educational environment caused by the network development. This system integrates the information of culture and creative works to cloud services to increase the visibility of products, provide business with references of matchmaking, and even contribute to industry cooperation or technology transfer. In other words, the application of this platform not only meets the teaching requirements but saves the cost of severing and the expenditure of personnel management. In this way, cultural and creative members can access abundant material at any time in a friendly environment. Meanwhile, traditional cultural and artistic institutions can also transfer to the digital centers of school-industry cooperation.

Also, the proposed cloud structure is divided into front and back-end systems. The front-end system is based on the existing equipment, including personal computers, hand-held devices, E-generation lecterns and equipment in computer labs. The back-end system is mainly virtual cloud platform, made up by data-storage hardware, RAID system and network facility with 10 GB bandwidth achieving the optimal speed of data upload and download. Virtual system is installed on each server and stored in a disk array. A manage system deploys resource allocation and back mechanism in back-end, to provide continuing application service. Virtualizing severs is an appropriate scheme to redistribute resources effectively and quickly when they need to be re-allocated.

Research Results

This research constructs "Cultural and Creative Platform of Image and Multi-Media Display", containing an appropriate admin page for managing cultural works, setting the classification of works and accounting the item number. For the operation of the front-end pages, we combine it with the school curriculum to increases student's familiarity with the platform. Thus, all creations of the classroom are preserved in the platform. Some key features are described in detail below:

1. Personal Works Upload

This study designs a simple interface and user-friendly setup to let each user get started to use the platform easily and upload their personal works quickly. The schematic diagram of user's interface is shown in Figure-1. The detailed items of this interface and corresponding description are listed in Table-1.

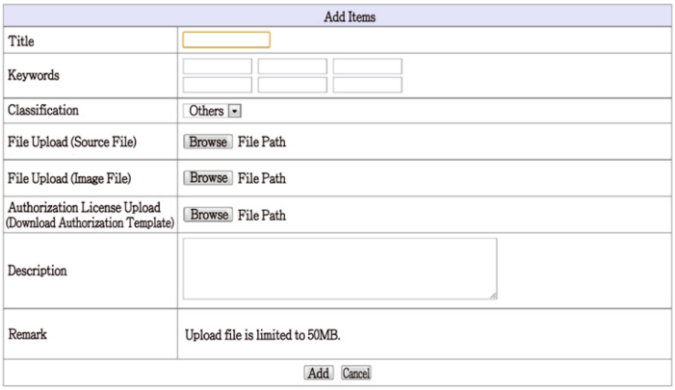

Figure 1: Upload interface for general user

Table 1: Items and the corresponding descriptions in upload interface

Item	Description
Title	Every work has a solid or abstract title.
Keywords	The default number of keywords is six. Users can search the cultural works more efficiently through keyword classification.
Classification	The upload files are classified into 2D, 3D objects or others.
File Upload	Users upload the original file of the art work without the limitation of data format.
Image Upload	Users can also upload their works in image format rather than the original file.
Authorization Upload	Users can upload the authorization text, which is currently divided into two categories: 1) Original files are available and objects in each file can be individually reused. 2) Only image files are available and objects in each file cannot be removed and reused.
Work Description	Authors illustrate their works in text.

2. Authorization Management

Authorization management page allows back-end manager to know which author only upload the works but does not attach a copyright text. Authors also can use this function to know which work has been approved, as shown in Figure-2. If the work is unauthorized, other users cannot view the information or download, making the platform a safe environment for preserving artworks without the concern of abusing by other users. The authorization management page contains a table with columns of the file name, classification, image file and project authorization. The intellectual property right of author's work is declared by Taiwan's "Creative CC License Terms." Thus, authors can upload their materials safely, while preventing other users from inadvertently violating laws due to the abusing of others' works.

3. Bulletin for Work Discussion

This function enables users to interact with authors and exchange user's opinions with them. After viewing the images and profiles of works, users can post their comments and discuss the ideas about collaborates with authors, as shown in Figure-3.

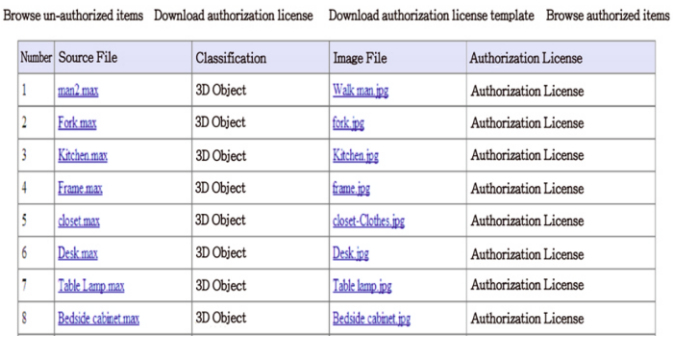

Figure 2: Interface of authorization management

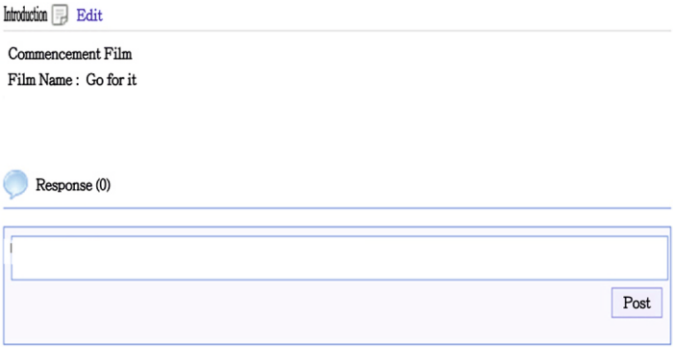

Figure 3: Interface of bulletin

Conclusions

By integrating the technology of cloud storage, this study designs "cultural and creative platform of image and multi- media display with cloud technology". The platform was commissioned to Center of Network and Information, TUT to construct the system. Storage of works created by teachers and students is no longer being restricted by hardware and software, and these works are kept safely and can be accessed more conveniently. Currently, this platform has collected more than 2000 pieces of 2D and 3D objects, which has far exceeded the target number of reservation. It shows the proposed system indeed has a high degree of efficiency in usage and has become an essential promote of digitization and preservation of artworks in the cultural and creative industry.

REFERENCES

1. Tsai, S. T., Su, W. C., & Chiu, C. Y. (2012). Using cloud storages for digital archives preservation and applications. Technology Museum Review, 16(4), 81-103.
2. Cheng, P. Y., & Yang, M. L. (2004). Applying standard operation procedure for the antiquities digital archives: A case study of the digital archives project for Chinese antiquities at the National Palace Museum. Retrieved April 15, 2016, from http://www.npm.gov.tw/uploads/20090218041600176 3/335000000E-I4Z-0 30.pdf.
3. Tsai, Y. C., Huang, G. L., & Qiu, Z. Y. (2007). Introduction to digital archives technology. Taipei: National Taiwan University Press.
4. Ho, J. M., Huang, S. K., Chuang, T. R., & Lee, D. T. (2000). On creation and management of digital libraries: System environment, human-computer interface and research issues. Journal of Library and Information Science, 26(2), 38-48.
5. Rockley, A., Kostur, P., & Manning, S. (2003). Managing enterprise content: A unified content strategy. New Riders.